

## **Reading a Reviewed Event Bulletin**

A Reviewed Event Bulletin (REB) -- as produced by the International Data Centre (IDC) -- provides a wealth of information. An REB typically covers a 24 hour period beginning at 0:00 GMT and describes every event recorded during that period which meets publication criteria. Analysts review, revise and verify the solution provided for each event. The result is a daily, human-reviewed bulletin typically describing 50 to 100 events. Most events described in an REB are natural in origin (earthquakes), though many are anthropogenic (quarry blasts, nuclear explosions, etc.).

The full specification for the format of the Reviewed Event Bulletin is provided in the official IDC Documentation. The volume "Formats and Protocols for Messages" [IDC3.4.1 Rev 1] provides a detailed description of the message-based formats -- including the REB -- utilized by the IDC. Below is an annotated REB, highlighting the key components of the report format.

**Bulletin Header:**

Format and delivery  
information

**Event Title Block:**

Event identifier and geographic region; marks the  
beginning of each new event report; typically, an REB  
will describe 50 to 100 events

**Bulletin Title Block:**

Title and time-range (typically 24  
hours) of bulletin, and time the  
report was generated

```
BEGIN IMS1.0
MSG_TYPE DATA
MSG_ID 3832607 GSE_IDC
PROD_ID 4 910
DATA_TYPE BULLETIN IMS1.0:SHORT
```

Reviewed Event Bulletin of the CTBT\_IDC from 2002/05/10 00:00:00 to 2002/05/11 00:00:00, generated 2002/05/16 15:28:56

EVENT 1165680 EASTERN GREENLAND

Date	Time	Err	RMS	Latitude	Longitude	Smaj	Smin	Az	Depth	Err	Ndef	Nsta	Gap	mdist	Mdist	Qual	Author	OrigID
2002/05/10	02:52:53.75	0.76	0.87	78.6260	-18.7056	24.9	13.9	20	0.0f		13	13	105	7.00	75.79	m i uk	IDC_REB	1168870

Magnitude	Err	Nsta	Author	OrigID
ML	3.4	0.2	3 IDC_REB	1168870
mb	3.6	0.1	11 IDC_REB	1168870
mb1	3.8	0.1	14 IDC_REB	1168870
mb1mx	3.8	0.1	25 IDC_REB	1168870
Ms	3.1	0.4	2 IDC_REB	1168870
Ms1	3.1	0.4	2 IDC_REB	1168870
ms1mx	2.7	0.1	18 IDC_REB	1168870

**Origin Block:**

Event time, location, error, and quality

**Magnitude Sub-block:**

Summary of event magnitudes

**Phase Block:**

List of detections

Sta	Dist	EvAz	Phase	Time	TRes	Azim	AzRes	Slow	SRes	Def	SNR	Amp	Per	Qual	Magnitude	ArrID
SPITS	7.00	76.3	Pn	02:54:36.790	-0.6	296.5	5.8	8.6	-5.1	T__	67.0	0.7	0.33	a__	ML 3.1	9112519
															mb1 3.4	
SPITS	7.00	76.3	Sn	02:55:54.132	-4.7	315.0	24.3	47.2	22.5	___	6.4	2.0	0.33	a__		9112524
ARCES	14.64	104.0	Pn	02:56:25.389	5.4	327.4	0.6	13.6	-0.1	___	5.4	0.2	0.33	m__	ML 3.2	9139249
															mb1 4.3	
NOA	19.96	134.7	P	02:57:27.745	0.7	330.5	-12.6	10.8	-0.0	T__	4.8	0.1	0.33	m__	ML 3.8	9139250
															mb1 3.4	
FRB	20.81	253.1	P	02:57:36.024	-0.1	22.6	-2.7	10.9	0.0	T__	3.6	3.3	0.80	a__	mb 3.7	9112517
															mb1 3.9	
HFS	21.19	132.1	P	02:57:42.018	1.7	14.0	31.1	10.3	-0.5	T__	8.9	2.3	0.50	a__	mb 3.8	9112525
															mb1 3.8	
FINES	21.99	115.3	P	02:57:49.825	1.0	347.0	8.9	9.4	-1.3	T__	21.1	4.0	0.59	a__	mb 4.0	9111776
															mb1 4.1	
EKA	23.99	157.9	P	02:58:09.682	0.2	347.7	-4.8	10.5	1.0	T__	3.6	0.9	0.67	m__	mb 3.5	9139252
															mb1 3.7	
SCHQ	28.83	243.3	P	02:58:52.951	-0.2	24.3	6.5	9.8	0.9	T__	7.8	1.2	0.50	a__	mb 4.1	9111755
															mb1 4.1	
YKA	30.84	295.7	P	02:59:10.292	-0.5	16.3	-4.9	8.2	-1.0	T__	5.7	0.2	0.51	m__	mb 3.2	9139251
															mb1 3.5	
ILAR	33.60	322.5	P	02:59:36.075	1.1	223.4	-152.	14.6	5.9	T__	2.8	0.1	0.80	m__	mb 2.9	9139248
															mb1 3.3	
ULM	38.76	271.1	LR	03:16:28.007	-10.5	191.2	173.1	36.5	-0.3	___		70.8	18.26	a__	Ms 3.6	9142520
															Ms1 3.5	
ZAL	40.27	62.8	LR	03:23:17.327	117.0	202.0	-140.	45.3	2.9	___		10.0	18.82	a__	Ms 2.7	9142511
															Ms1 2.7	
MKAR	46.68	68.0	P	03:01:22.876	-0.5	358.3	13.9	4.9	-2.9	T__	22.5	0.9	0.45	a__	mb 4.0	9111864
															mb1 4.0	
PDAR	48.63	281.1	P	03:01:39.976	1.1	56.0	-7.5	3.5	-4.2	T__	3.9	0.3	0.64	a__	mb 3.3	9111830
															mb1 3.7	
TXAR	60.47	271.4	P	03:03:04.526	-0.4	36.1	7.1	4.5	-0.7	T__	7.0	0.7	0.73	a__	mb 3.7	9111831
															mb1 4.3	
BGCA	75.79	141.7	P	03:04:39.924	-1.3	336.3	-6.6	5.2	-0.5	T__	10.2	1.1	0.64	a__	mb 4.1	9112046
															mb1 4.1	

STOP

**Bulletin Footer:**

End of message

## Origin Block:

Date	Time	Err	RMS	Latitude	Longitude	Smaj	Smin	Az	Depth	Err	Ndef	Nsta	Gap	mdist	Mdist	Qual	Author	OrigID
2002/05/10	02:52:53.75	0.76	0.87	78.6260	-18.7056	24.9	13.9	20	0.0f		13	13	105	7.00	75.79	m i uk	IDC_REB	1168870

RMS  
0.87  
Root mean square  
of travel time  
residuals (seconds)

Latitude Longitude  
78.6260 -18.7056  
Event Location

Date Time Err  
2002/05/10 02:52:53.75 0.76  
Origin time and 90% confidence error  
estimate (seconds)

Smaj Smin Az  
24.9 13.9 20  
Geometry of 90% event location confidence  
ellipse; semi-major and semi-minor axes in  
km; Azimuth in degrees clockwise from  
North

Depth Err  
0.0f  
Depth (in km) and 90% confidence depth  
estimate error; an 'f' following the depth  
indicates the depth was fixed; error estimates  
are not given when the depth is fixed

Author OrigID  
IDC\_REB 1168870  
Solution Identifier

Ndef Nsta Gap mdist Mdist  
13 13 105 7.00 75.79  
Ndef: Number of defining phases  
Nsta: Number of defining stations  
Gap: Largest azimuthal coverage gap  
mdist: Distance (deg) to closest station  
Mdist: Distance (deg) to furthest station

Qual  
m i uk  
Field 1: analysis type  
m – manual a – automatic  
Field2: location method  
i – inversion p – pattern recognition  
g – ground truth o – other  
Field 3: event type  
uk – unknown se – suspected earthquake  
ke – known earthquake sr – suspected rockburst  
kr – known rockburst si – suspected induced event  
ki – known induced event si – suspected mine expl.  
km – known mine expl. sx – suspected experimental expl.  
kx – known experimental expl. sn – suspected nuclear explosion  
kn – known nuclear explosion ls -- landslide  
ls -- landslide

### Magnitude Sub-block:

Magnitude	Err	Nsta	Author	OrigID
ML	3.4	0.2	3 IDC_REB	1168870
mb	3.6	0.1	11 IDC_REB	1168870
mb1	3.8	0.1	14 IDC_REB	1168870
mb1mx	3.8	0.1	25 IDC_REB	1168870
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Ms1	3.1	0.4	2 IDC_REB	1168870
ms1mx	2.7	0.1	18 IDC_REB	1168870

Author	OrigID
IDC_REB	1168870
Solution Identifier	

Nsta
3
Number of contributing stations

Magnitude	Err
ML	3.4 0.2
Magnitude type, value, and 90% confidence error estimate	

ML	Local magnitude
mb	Body wave magnitude
mb1	Body wave magnitude extended down to 2 degrees distance and incorporating station corrections
mb1mx	Maximum likelihood body wave magnitude extended down to 2 degrees distance and incorporating station corrections; supplemented with noise measurements at non-detecting stations to provide an upper bound estimate
Ms	Surface wave magnitude
Ms1	Surface wave magnitude extended down to 2 degrees distance and incorporating station corrections
ms1mx	Maximum likelihood surface wave magnitude extended down to 2 degrees distance and incorporating station corrections; supplemented with noise measurements at non-detecting stations to provide an upper bound estimate

## Phase Block:

Sta	Dist	EvAz	Phase	Time	TRes	Azim	AzRes	Slow	SRes	Def	SNR	Amp	Per	Qual	Magnitude	ArrID
SPITS	7.00	76.3	Pn	02:54:36.790	-0.6	296.5	5.8	8.6	-5.1	T__	67.0	0.7	0.33	a__	ML 3.1 mb1 3.4	9112519

